

14th, which were for practically the entire forecast district, except extreme southern Florida. At 8 a. m. of that date a shallow trough of low pressure was advancing eastward over the Atlantic States and the Appalachian region and an area of high pressure of great magnitude (Rapid City, S. Dak., 31.10 inches), accompanied by much colder weather, had already overspread all sections between the Rocky Mountains and the Mississippi River. By 8 a. m. of the 15th the line of zero temperature extended southward to Kentucky, and 10° to Birmingham, Ala. and Atlanta, Ga. During the following night the temperature fell to 20° in extreme northern Florida and 28° at Tampa.

On the 22d cold-wave warnings were issued for portions of the Ohio valley and the northern border States and on the 25th-26th for the Atlantic States as far south as North Carolina. The warnings of the 22d were not verified, while those of the 25th-26th were well verified in most States.

Frost warnings were issued for the extreme South on the 1st, 2d, 9th, 10th, 11th, 14th, and 15th. The most important of these warnings were for the freeze of the night of the 15th-16th, when the temperature fell to 20° or slightly lower in extreme northern Florida and to 28° at Tampa, with frost nearly to the extreme southern coast of Florida. No frost warnings were required after the middle of the month.—*C. L. Mitchell.*

#### CHICAGO FORECAST DISTRICT

January in the Chicago forecast district was not characterized by unusual storm movement. The mean temperature was above normal over most of the district, especially west of the Mississippi, and close to normal east of it. Precipitation was heavy to excessive in the Ohio Valley and southern Missouri, but below normal almost everywhere else. The low pressure areas, as a rule, passed rapidly eastward with their centers well to the north; but in a few instances they passed directly eastward across the center of the country, especially those of January 12-13, 18-19, and 20-22; these were the storms responsible for the heavy precipitation in the southern portion of the forecast district.

The cold waves were not severe; and warnings of them were given over most of the areas affected, either through forecasts of cold waves or much colder weather.

Advisory warnings of strong winds were issued for the open ports on Lake Michigan from time to time.

Perhaps the principal feature of the month was the passage over the district of two exceptionally high pressure areas. One, on the 14th-15th, with a pressure of 31.10 inches in South Dakota, decreased in magnitude with its eastward movement; while the second, on the 25th-26th, pushed southeastward from eastern Manitoba across the upper Mississippi Valley and Great Lakes region with increasing pressure. In the northern lakes region it was as high as 31.06 inches. At Chicago the highest pressure observed since the establishment of the station in 1870 was registered on the 26th, 30.97 inches.

This high-pressure area was accompanied by extremely low temperatures in the northern portion of the forecast district, a minimum of 32° below zero being registered at Sault Ste. Marie, the lowest of record for the month of January at that point.—*H. J. Cox.*

#### NEW ORLEANS FORECAST DISTRICT

Weather throughout the district was generally mild for the season during the first 10 days of the month. Cold-wave warnings were issued on the night of the 12th

for Arkansas, Oklahoma, the northern portion of east Texas, and northern Louisiana, and on the morning of the 13th were extended to the Texas coast and over Louisiana, except the southeast portion, with forecast of freezing to the Louisiana coast by the morning of the 15th. A severe cold wave occurred, giving temperatures near zero over the extreme northern portion of the district, and freezing to the west and middle Gulf coast.

Cold-wave warnings were issued on the morning of the 17th for Oklahoma, northwest Arkansas, and northern and western Texas. The warnings were verified in portions of the area but the verifying temperature did not occur in Texas. Warnings were issued on the 21st and 22d for the district except southeastern Louisiana. A decided cold wave occurred over the northern portion of the district, extending as far south as central Texas, but the high-pressure area changed its course to the eastward and the cold wave did not extend to the Gulf coast.

Storm warnings were issued for portions of the Texas coast on the 13th, 14th, and 22d; the warnings of the 13th and 14th were justified but no high winds occurred following the warnings of the 22d. No general storm occurred without warning, but high winds occurred at Galveston on the night of the 9th.

Norther warnings were issued on the 13th for American interests at Tampico, Mexico. High winds occurred as forecast.—*I. M. Cline.*

#### DENVER FORECAST DISTRICT

Except in portions of southern and western Montana and northeastern Wyoming, where the temperature was somewhat below normal, the month was considerably warmer than the average throughout the district. Precipitation was deficient everywhere except in northern and eastern Utah and northwestern Colorado.

Temperatures much below normal, however, prevailed from Montana southward to eastern Colorado on the 12th and 13th, the cold continuing in Montana and Wyoming and eastern Colorado until the 14th. Another cold wave made its appearance over Montana on the 16th-17th and rapidly extended southward to northern Texas. Severely cold weather in Montana and northern Wyoming continued until the 22d, temperatures below -30° occurring in north-central Montana on the 20th and in most of eastern Montana on the 21st, with readings below zero as far south as extreme northeastern Colorado on the morning of the 21st. Moderating weather on the eastern slope attended lower pressures in western Canada on the 22d.

Warning of a moderate cold wave in eastern Wyoming was issued on the evening of the 11th. The warning was extended to eastern Colorado on the morning of the 12th and to eastern New Mexico on the evening of the 12th. These warnings were fully verified. On the morning of the 16th, warning was issued of a moderate cold wave in eastern Montana. This was extended on the evening of the 16th to eastern and southern Wyoming and Eastern Colorado. On the morning of the 17th the warning was repeated for eastern and southern Wyoming and eastern Colorado, and stockmen were notified. The warnings were justified, the cold wave being attended by light snows in the region specified. On the morning of the 18th, warning of a severe cold wave was issued for northwestern Wyoming, which was verified during the following day. A warning of a severe cold wave, with stockmen's warnings, was issued on the morning of the 21st for Utah, southern and western Colorado, northern and extreme eastern New Mexico, and north-central and northeastern Arizona. Warnings of a moderate cold